IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Patrick Johannes Blom et al.
Serial No.:	10/069,263
Art Unit:	1774
Filed:	June 19, 2002
Title:	TRANSFER LABEL
Examiner:	Tamra L. Dicus
Docket No.:	34434

DECLARATION OF PATRICK JOHANNES BLOM

Patrick Johannes Blom declares as follows.

1. I presently reside at Jan Keldermansstraat 9, 2321 EZ Leiden, The Netherlands.

2. I am one of the inventors in the above-referenced U.S. Patent Application Serial No. 10/069,263, filed on June 19, 2002.

3. My educational background is as follows: MSc in Environmental Chemistry, Rijks Universiteit Leiden, located at Leiden, The Netherlands, 1992.

4. My work experience and training is as follows: 1992-1993 Royal Dutch Shell Exploration Laboratories. Since 1993 I have worked for Heineken Technical Services B.V., the assignee of the above-referenced patent application, the first three years in Detachment from Randstad BV. My function within Heineken Technical Services is Scientist, specialist in decoration techniques and technologies. My duties for Heineken have included the development of different Image Transfer projects since 1996.

5. I am familiar with the subject matter of the above-referenced U.S. Patent Application Serial No. 10/069,263. As a co-inventor of the above-referenced patent application, I participated in the research and development leading up to the patent application and am familiar with the problems described in the patent application and also with the solution to those problems as set forth in the patent application, including the Examples set forth therein. The following statements are based upon this background and experience and my working in this field and my participating in the aforementioned research and development, including the Examples.

6. One embodiment of the present invention resides in using in the opaque layer a standard or conventional pigment, preferably TiO_2, and combining with that pigment a relatively small amount of aluminum powder. Thus, it is essential that there are a first pigment and the aluminum powder in the pigmented opaque layer. For the first pigment, zinc oxide or titanium dioxide may be used, although other pigments are suitable too. It is known in the art that, in order to try to obtain opacity, it is preferred to use pigments having as high a refractive index as possible, as this gives the best opaque properties (see for example the attached excerpt for the website of the Department of Polymer Science of the University of Southern Mississippi, wherein the background of this aspect of pigments is discussed).

7. Titanium dioxide has the highest refractive index (see attached chart) and is accordingly considered to be the best opacifying pigment. Zinc oxide is much lower and calcium carbonate has a refractive index that is in the order of magnitude of 1.5.

8. As has been described in the specification of my application and in the comparative example thereof, even with the best opacifying pigment, TiO_2, no acceptable hiding in the opaque layer could be obtained. Only when I made the unexpected and surprising discovery that by adding a small amount of aluminum powder to the existing opaque layer, a good quality opaque layer was obtained, without any problems with printing, due to the amount of solids in the opaque layer. The experiments which were conducted are described more in detail as follows.

9. Example 1 (Comparative Example)

A transfer label was prepared by rotogravure printing with the following sequence of layers printed onto a siliconised film of OPP:

1. Protective layer, comprising a transparent acrylic ink.

2. One or more (up to eight) ink image layers, comprising of suitable pigmented inks or dyes.

3. A first white pigmented layer containing white pigment in an acrylic binder, the white pigment being exclusively TiO_2 present at a rate of 2 g/m^2.

4. A second white pigmented layer which was identical to the first white pigmented layer mentioned above.

5. A binding layer, providing adhesion between the white pigmented layers and the adhesive layer.

6. A heat activatable adhesive layer.

The label was then transferred onto the surface of a plastic bottle crate, over an existing silk screen printing. The result was then observed.

10. Example 2 (Example according to the invention)

1. Protective layer, comprising a transparent acrylic ink.

2. One or more (up to eight) ink image layers, comprising of suitable pigmented inks or dyes.

3. A first white pigmented layer containing white pigment in an acrylic binder, the white pigment being exclusively TiO_2 present at a rate of 2 g/m^2.

4. A second white pigmented layer containing white pigment in an acrylic binder, the white pigment being, in combination, 1.97 g/m^2 of TiO_2 and 0.03 g/m^2 of aluminum powder having a particle size of 15 µm.

5. A binding layer, providing adhesion between the white pigmented layers and the adhesive layer.

6. A heat activatable adhesive layer.

The label was then transferred onto the surface of a plastic bottle crate, over an existing silk screen printing. The result was then observed.

11. In Example 1 the two white layers each contained 2 g/m^2 of TiO_2 white pigment, and thus the total amount of white pigment in Example 1 was 4 g/m^2. Even with this large amount of TiO_2 white pigment the pre-existing silk screen printing could be visually noticed through the label image.

12. In Example 2 the first white pigmented layer was the same as the first white pigmented layer of Example 1, but for the second white pigmented layer 0.03 g/m^2 of TiO_2 was removed and was replaced with 0.03 g/m^2 of aluminum powder. Despite this small substitution, surprisingly and unexpectedly the label was completely opaque and the existing printing could not be visually noticed through the label image. Also, the printing and application characteristics were good.

13. The results of Examples 1 and 2 were surprising and unexpected. The only difference was that in Example 2, 0.03 g/m^2 of TiO_2 in the second pigmented layer was removed and was replaced with 0.03 g/m^2 of aluminum powder. As mentioned above, titanium dioxide has the highest refractive index and is accordingly considered to be the best opacifying pigment. When you remove a certain quantity of the best opacifying pigment and replace it with what is considered a lesser opacifying pigment, you would expect the opacifying properties to be less, not more. However, as shown in Examples 1 and 2 above, when 0.03 g/m^2 of the better opacifying pigment, TiO_2, was removed and was replaced with 0.03 g/m^2 of what was thought of

as a lesser opacifying pigment, aluminum powder, surprisingly and unexpectedly the opacifying properties improved dramatically rather than getting worse. This is a surprising and unexpected result. It is surprising and unexpected when you expect something to get worse but rather it gets better. It was also surprising and unexpected that the substitution of a small amount of aluminum powder for TiO_2 in a large amount of a conventional white pigment such as TiO_2 could have such a dramatic impact on the hiding power of the opaque layer. It was surprising and unexpected that the substitution of a small amount of aluminum powder for TiO_2 could turn an opaque layer from one that could not hide an underlying image into one that could successfully and effectively hide an underlying image.

14. I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. 1001 and that such willful false statements may jeopardize the validity of the patent application or any patent issued thereon.

Feb 10, 2005
Date

Patrick Johannes Blom